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LIANG, REGINA

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UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* JONATHAN D. ALBERT, BARRETT COMISKEY, and  
RUSSELL J. WILCOX

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Appeal 2009-005460  
Application 10/711,238<sup>1</sup>  
Technology Center 2600

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Decided: October 14, 2009

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Before MAHSHID D. SAADAT, SCOTT R. BOALICK, and  
ELENI MANTIS MERCADER, *Administrative Patent Judges*.

BOALICK, *Administrative Patent Judge*.

DECISION ON APPEAL

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<sup>1</sup> Application filed September 3, 2004. Application 10/711,238 is a continuation of U.S. Patent No. 6,825,829, filed August 27, 1998, which claims the benefit under 35 U.S.C. § 119(e) of multiple provisional applications, with the earliest filing date being August 28, 1997. The real party in interest is E Ink Corporation.

This is an appeal under 35 U.S.C. § 134(a) from the final rejection of claims 1-16, 18 and 20. Claims 17 and 19 have been indicated to be allowable if rewritten in independent form. We have jurisdiction under 35 U.S.C. § 6(b).

We affirm-in-part.

#### STATEMENT OF THE CASE

Appellants' invention relates to an encapsulated electrophoretic display (Spec. ¶ [0008]) having an adhesive backing and a process for manufacturing the display (Spec. Abstract).

Claim 1 is exemplary:

1. An electrically active display comprising:

a bistable optoelectrically active display medium capable of changing its optical state upon application of an electric field thereto and having first and second surfaces on opposed sides thereof;

an optically transmissive electrode in contact with the first surface of the display medium; and

an adhesive layer disposed on the second surface of the display medium, the surface of the adhesive remote from the display medium forming an external surface of the display, so that the display can be attached to a receiving surface by the adhesive layer.

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

Sheridon	4,126,854	Nov. 21, 1978
Inoue	4,922,241	May 1, 1990
Sato	5,173,342	Dec. 22, 1992

Rothschild	5,802,015	Sept. 1, 1998 (filed May 5, 1997)
Richley	5,900,858	May 4, 1999 (filed May 30, 1997)
Brody	6,285,343 B1	Sept. 4, 2001 (filed Oct. 19, 1994)

Claims 1-4, 10, 12, 16, 18 and 20 stand rejected under 35 U.S.C. § 103(a) as being obvious over Rothschild, Sato and Inoue.

Claims 5 and 13 stand rejected under 35 U.S.C. § 103(a) as being obvious over Rothschild, Sato, Inoue and Richley.

Claims 6, 7, 14 and 15 stand rejected under 35 U.S.C. § 103(a) as being obvious over Rothschild, Sato, Inoue and Sheridan.

Claims 8, 9 and 11 stand rejected under 35 U.S.C. § 103(a) as being obvious over Rothschild, Sato, Inoue and Brody.<sup>2</sup>

Except as noted in this decision, Appellants have not presented any substantive arguments directed separately to the patentability of the dependent claims. In the absence of a separate argument with respect to those claims, they stand or fall with the representative independent claim. *See* 37 C.F.R. § 41.37(c)(1)(vii). Only those arguments actually made by Appellants have been considered in this decision. Arguments that Appellants did not make in the Brief have not been considered and are deemed to be waived. *See id.*

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<sup>2</sup> The Examiner's Answer inadvertently omits Inoue from the statement and the body of the rejection. (Ans. 6.)

## ISSUE

With respect to claims 1-4, 10, 12, 16, 18 and 20, Appellants argue that “there is no logical way to combine Rothschild, Sato and Inoue” because “the Rothschild display does not suffer from the problem which Inoue is designed to solve, and hence there is no incentive to combine Rothschild with Inoue.” (Br. 14.)

With respect to dependent claims 6, 7, 14 and 15, Appellants argue that the combination of Rothschild, Sato, Inoue and Sheridan does not teach or suggest the limitation “wherein the display medium comprises an electrophoretic medium comprising at least one species of particles dispersed in a fluid medium,” as recited in claims 6 and 14. (Br. 15.)

With respect to dependent claims 8, 9 and 11, Appellants argue that the combination of Rothschild, Sato, Inoue and Brody does not teach or suggest the limitation “at least one conductive via extending from the electrode through the display medium,” as recited in claims 8 and 11. (Br. 15-16.)

Appellants’ arguments present the following issue:

Have Appellants shown that the Examiner erred in rejecting claims 1-16, 18 and 20 under 35 U.S.C. § 103(a)?

The resolution of this issue turns on the following subsidiary issues:

1. Have Appellants shown that the Examiner erred by improperly combining the applied references?
2. Have Appellants shown that the Examiner erred in finding that the combination of Rothschild, Sato, Inoue and Sheridan teaches or suggests the limitation “wherein the display medium comprises an electrophoretic

medium comprising at least one species of particles dispersed in a fluid medium,” as recited in dependent claims 6 and 14?

3. Have Appellants shown that the Examiner erred in finding that the combination of Rothschild, Sato, Inoue and Brody teaches or suggests the limitation “at least one conductive via extending from the electrode through the display medium,” as recited in dependent claims 8 and 11?

### FINDINGS OF FACT

The record supports the following findings of fact (FF) by a preponderance of the evidence.

#### *Rothschild*

1. Rothschild relates to “[a]n electronic timing label for indicating the expiration of a time period associated with a particular article.” (Abstract.) The timing label includes “a display for indicating the expiration of the time period.” (*Id.*)
2. Rothschild describes an electronic timing label 10 affixed to a bottle 11 with double-sided foam tape 18. (Col. 5, ll. 2-5; figs. 1, 2.) The label 10 includes an electronic output device 14. (Col. 4, ll. 55-56; fig. 1.) “The preferred embodiment supposes the use of a liquid crystal TN [twisted nematic] type display segment for output device 14.” (Col. 7, ll. 38-39; fig. 8.) “[A] TN liquid crystal display device includes a clear plastic or glass display panel 14a containing an electrosensitive display media.” (Col. 7, ll. 40-42; fig. 8.) Rothschild

teaches that by applying a voltage to the display panel 14a, it turns from clear to dark (col. 7, ll. 43-45).

*Sato*

3. Sato relates to “an orientation film used in a liquid crystal display device.” (Col. 1, ll. 8-9.) Sato describes that “a liquid crystal 1 is in contact with a pair of substrates 3 each having an electrode 2 at a surface facing the liquid crystal 1.” (Col. 2, ll. 13-15; figure.) The electrode 2 can be a transparent electrode material including indium tin oxide (ITO) or SnO<sub>2</sub>. (Col. 2, ll. 27-28.) The liquid crystal can be a twisted nematic liquid crystal (col. 1, ll. 11-13) or a ferroelectric liquid crystal (col. 1, ll. 15-16).

*Inoue*

4. Inoue “relates to a display device and, more particularly, to a display device having a memory function, e.g., a display device using a ferroelectric liquid crystal element.” (Col. 1, ll. 8-11.)
5. Inoue describes that for display devices, “[t]he most popular liquid crystal element is a TN (twisted nematic) element since it has a relatively short response time among the liquid crystal materials and a low power consumption.” (Col. 1, ll. 27-30.) However, with an increasing number of scanning lines in display devices (col. 2, ll. 4-12), “a decrease in image contrast and crosstalk phenomenon cannot be avoided” for the TN element (col. 2, ll. 12-13).

6. As an alternative, Inoue describes that a ferroelectric liquid crystal (FLC) has the advantages of “a very short response time (1  $\mu$ sec to 100  $\mu$ sec[])” and “a bistable state” (col. 3, ll. 45-49) during the application of an electric field (col. 3, ll. 50-62; fig. 46). Liquid crystals with a bistable state have a memory function (i.e., the orientation state of the liquid crystal is unchanged when the electric field is removed). (Col. 3, ll. 53-54, 57-60.)

*Sheridon*

7. Sheridan describes “[a] display system in which the display panel is comprised of a plurality of particles.” (Abstract.) Sheridan further describes a display 2 including a display panel 4 between substrates 6 and 8. (Col. 3, ll. 19-21; figs. 1, 2.) The display panel 4 includes “a distribution of minute particles 14 . . . surrounded by a transparent dielectric fluid [18]” (col. 3, ll. 35-37; figs. 2, 2A) within “a solid, optically transparent support material 15” (col. 3, ll. 43-44; figs. 2, 2A). “[E]ach of the spheres 14 is located within a cavity 16 of the transparent support material 15” such that the “[c]avities 16 have a diameter slightly larger than the diameter of spheres 14.” (Col. 3, l. 67 to col. 4, l. 1; figs. 2, 2A.)

*Brody*

8. Brody relates to “a flat-screen television display.” (Col. 1, ll. 18-19.) The flat-screen television display 10 is formed of multiple modules 11. (Col. 6, ll. 47-49; fig. 1.) Each module 11 has a first major surface 15, a second major surface 16, edge surfaces 17 and



- includes a matrix of picture elements 18 extending over the first major surface 15. (Col. 7, ll. 3-6; fig. 3.) “The picture elements 18 are preferably formed in a light modulating film composed of a liquid crystal dispersion in a polymeric binder . . . .” (Col. 7, ll. 18-21.)
9. The picture elements 18 are controlled by electrical switching elements 20, which include a row conductive strip 21 and a column conductive strip 22. (Col. 7, ll. 24-29.) To complete the electrical circuit of electrical switching elements 20, a transparent conductive layer 28 on an opposite surface of picture elements 18 is connected to an interconnecting conductor 30. (Col. 7, ll. 51-55.)
- “[I]nterconnecting conductors 30 are preferably positioned over edge surfaces 17 . . . and wrap around second major surface 16 to electrically connect conductive strips 21, 21’, 22 and 22’ to electrical drive circuit 29.” (Col. 8, ll. 24-28; figs. 3, 5.) Figure 4C illustrates that interconnecting conductors 30 extend vertically from the second major surface 16 to conductive pads 19, along edge surfaces 17.

#### PRINCIPLES OF LAW

On appeal, all timely filed evidence and properly presented arguments are considered by the Board. *See In re Piasecki*, 745 F.2d 1468, 1472 (Fed. Cir. 1984).

“Section 103 forbids issuance of a patent when ‘the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said

subject matter pertains.”” *KSR Int’l Co. v. Teleflex, Inc.*, 550 U.S. 398, 406 (2007). In *KSR*, the Supreme Court emphasized “the need for caution in granting a patent based on the combination of elements found in the prior art,” *id.* at 415, and discussed circumstances in which a patent might be determined to be obvious. In particular, the Supreme Court emphasized that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results.” *Id.* at 416. The Court explained:

When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill.

*Id.* at 417.

During the examination of a patent application, a claim is given its broadest reasonable construction consistent with the specification. *In re Prater*, 415 F.2d 1393, 1404-05 (CCPA 1969). “[T]he words of a claim ‘are generally given their ordinary and customary meaning.’” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1312 (Fed. Cir. 2005) (en banc) (internal citations omitted). The “ordinary and customary meaning of a claim term is the meaning that the term would have to a person of ordinary skill in the art in question at the time of the invention, i.e., as of the effective filing date of the patent application.” *Id.* at 1313.

## ANALYSIS

We find Appellants' arguments that the Examiner erred in rejecting claims 1-5, 8-13, 16, 18 and 20 under 35 U.S.C. § 103(a) to lack merit. However, we agree with Appellants that the Examiner erred in rejecting claims 6, 7, 14 and 15 under 35 U.S.C. § 103(a).

### *Claims 1-4, 10, 12, 16, 18 and 20*

Appellants' arguments (Br. 14-15) that the Examiner erred by improperly combining the applied references are not persuasive.

The Examiner found that Rothschild teaches all the limitations of representative claim 1<sup>3</sup> except the limitation "an optically transmissive electrode in contact with the first surface of the display medium" (Ans. 3) and "a bistable . . . display medium capable of changing its optical state upon application of an electric field thereto" (Ans. 4). The Examiner cited Sato for the disclosure of a transparent electrode 2 formed on a pair of substrates 3 with the electrodes 2 facing a liquid crystal 1. (Ans. 3-4; FF 3.) The Examiner also cited Inoue for the disclosure of a ferroelectric liquid crystal (FLC) with a bistable state under an applied electric field. (Ans. 4; FF 6.) The Examiner concluded that claim 1 was obvious over the combination of Rothschild, Sato and Inoue. (Ans. 3-4.) We generally agree with the Examiner.

Rothschild teaches applying a voltage to a clear plastic or glass display panel 14a containing a liquid crystal to switch the display panel 14a

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<sup>3</sup> Appellants argue claims 1-4, 10, 12, 16, 18 and 20 together as a group. (Br. 12-15.) Accordingly, we select claim 1 as representative. *See* 37 C.F.R. § 41.37(c)(1)(vii).

from clear to dark. (FF 2.) Sato teaches a liquid crystal display in which a liquid crystal 1 is located between a pair of substrates 3 with each substrate 3 having a transparent electrode 2 facing the liquid crystal 1. (FF 3.) Thus, modifying Rothschild's display panel 14a to include Sato's transparent electrodes 2 facing the liquid crystal 1 would have been obvious because it is the mere combination of Sato's known liquid crystal display, including transparent electrodes 2, with Rothschild's known display panel 14a, to yield predictable results. *See KSR*, 550 U.S. at 416. Appellants have not presented any convincing arguments or evidence that the Examiner erred in combining Rothschild with Sato.

Moreover, Rothschild teaches applying a voltage to the clear plastic or glass display panel 14a to switch the liquid crystal media from clear to dark. (FF 2.) Thus, to enable the application of a voltage across the display panel 14a, the front and back substrates of the display panel 14a would inherently contain electrodes. (*See id.*) Furthermore, because Rothschild teaches that the display panel 14a is "clear" (FF 2), such electrodes would be "optically transmissive" (*see id.*).

Additionally, Rothschild teaches a display panel 14a containing a twisted nematic (TN) liquid crystal (FF 2) and Sato teaches a liquid crystal display with either TN or ferroelectric liquid crystals (FF 3). Inoue teaches ferroelectric liquid crystals (FLC) as an alternative to TN liquid crystals for display devices. (FF 6.) Inoue also teaches that some advantages of displays using FLC include very short response times (i.e., 1 to 100  $\mu$ sec) and the ability to form displays with a memory function because FLC has a bistable state. (*Id.*) Thus, combining Inoue with Rothschild and Sato is no more than the simple substitution of Inoue's known FLC for Rothschild's or

Sato's known TN liquid crystal, with predictable results. *See KSR*, 550 U.S. at 417. Appellants have not presented any convincing arguments or evidence that the Examiner erred in combining Inoue with Rothschild and Sato.

Therefore, Appellants have not shown that the Examiner erred in combining the applied references. We conclude that Appellants have not shown that the Examiner erred in rejecting claim 1 under 35 U.S.C. § 103(a). Claims 2-4, 10, 12, 16, 18 and 20 were not argued separately, and fall together with claim 1.

#### *Claims 5 and 13*

Although Appellants nominally argue the rejection of dependent claims 5 and 13 separately (Br. 15), the arguments presented do not point out with particularity or explain why the limitations of the dependent claims are separately patentable. Instead, Appellants summarily allege that “[t]here is nothing in Richley which renders it logical to combine Rothschild, Sato and Inoue.” (Br. 15.) Because Appellants have not shown error in the Examiner's rejection for dependent claims 5 and 13 based on the teachings of Rothschild, Sato, Inoue and Richley, we will sustain the rejection of claims 5 and 13 for the reasons discussed with respect to independent claims 1 and 10, from which claims 5 and 13 depend.

#### *Claims 6, 7, 14 and 15*

Appellants' arguments (Br. 15) that the Examiner erred in finding that the combination of Rothschild, Sato, Inoue and Sheridan teaches or suggests the limitation “wherein the display medium comprises an electrophoretic

medium comprising at least one species of particles dispersed in a fluid medium,” as recited in dependent claims 6 and 14, are persuasive.

The Examiner acknowledged that the combination of Rothschild, Sato, Inoue and Sheridan does not teach or suggest the limitation “wherein the display medium comprises an electrophoretic medium comprising at least one species of particles dispersed in a fluid medium.” (Ans. 5.) The Examiner cited Sheridan for the disclosure of a display panel 4 with a distribution of minute particles 14 surrounded by a transparent dielectric fluid 18 and found that Sheridan teaches “at least one species of particles dispersed in a fluid medium.” (Ans. 5-6.)

We do not agree. A relevant plain meaning of “dispersed” is “to distribute (as fine particles) more or less evenly throughout a medium.” *Webster’s Ninth New Collegiate Dictionary* 365 (1990). Sheridan teaches a display panel 4 with a distribution of minute particles 14 in a solid, optically transparent support material 15. (FF 7.) Each of the particles 14 is located within a cavity 16 having a slightly larger diameter, in which the cavity 16 is filled with a dielectric fluid 18. (*Id.*) However, we do not find that Sheridan’s minute particles 14 are “dispersed in a fluid medium.” Instead of the minute particles 14 being distributed more or less evenly throughout the dielectric fluid 18, the particles 14 are distributed more or less evenly throughout the solid material 15 (i.e., a solid medium), with each particle 14 being individually encapsulated within a spherical shell of dielectric fluid 18 filling a cavity 16 in the solid material 15 (*see id.*).

Therefore, Appellants have shown that the Examiner erred in finding that the combination of Rothschild, Sato, Inoue and Sheridan teaches or suggests the limitation “wherein the display medium comprises an

electrophoretic medium comprising at least one species of particles dispersed in a fluid medium,” as recited in dependent claims 6 and 14.

We conclude that Appellants have shown that the Examiner erred in rejecting claims 6 and 14 as well as claims 7 and 15, which depend from claims 6 and 14, under 35 U.S.C. § 103(a).

*Claims 8, 9 and 11*

Appellants’ arguments (Br. 15-16) that the Examiner erred in finding that the combination of Rothschild, Sato, Inoue and Brody teaches or suggests the limitation “at least one conductive via extending from the electrode through the display medium,” as recited in dependent claims 8 and 11, are not persuasive.

The Examiner acknowledged that the combination of Rothschild, Sato, and Inoue does not teach or suggest the limitation “at least one conductive via extending from the electrode through the display medium.” (Ans. 6.) The Examiner cited Brody for the disclosure of a flat-screen television display 10 with picture elements 18 including interconnecting conductors 30 and found that Brody teaches “at least one conductive via extending from the electrode through the display medium.” (Ans. 6.) We agree with the Examiner.

Brody teaches a flat-screen television display 10 formed from multiple modules 11, each module 11 including a matrix of picture elements 18 containing a liquid crystal dispersion. (FF 8.) Brody further teaches that interconnecting conductors 30 extend from an electrical driver circuit 29 along edge surfaces 17 of the module 11 to electrically connect electrical switching elements 20 with a transparent conductive layer 28 on an

opposite surface of picture elements 18. (FF 9.) In other words, Brody teaches that the interconnecting conductors 30 extend from the transparent conductive layer 28 along the edge surfaces 17 or “through” the picture elements 18 containing the liquid crystal dispersion.

Appellants argue that because Brody’s “interconnecting conductor 30 is spaced from the liquid crystal medium by the material used to seal the individual modules, the conductor 30 does not extend through the liquid crystal medium.” (Br. 16.) Although Appellants are attempting to distinguish over Brody by arguing that the conductive via is exposed or in contact with the display medium, this feature is not claimed.

Therefore, Appellants have not shown that the Examiner erred in finding that the combination of Rothschild, Sato, Inoue and Brody teaches or suggests the limitation “at least one conductive via extending from the electrode through the display medium,” as recited in dependent claims 8 and 11.

We conclude that Appellants have not shown that the Examiner erred in rejecting claims 8 and 11 under 35 U.S.C. § 103(a). Because Appellants have not presented arguments regarding claim 9, we affirm the rejection of this claim under 35 U.S.C. § 103(a) for the same reasons as claim 8, from which claim 9 depends.

## CONCLUSION

Based on the findings of fact and analysis above, we conclude that:

(1) Appellants have not shown that the Examiner erred in rejecting claims 1-5, 8-13, 16, 18 and 20 under 35 U.S.C. § 103(a).



(2) Appellants have shown that the Examiner erred in rejecting claims 6, 7, 14 and 15 under 35 U.S.C. § 103(a).

#### DECISION

The rejection of claims 1-5, 8-13, 16, 18 and 20 under 35 U.S.C. § 103(a) is affirmed.

The rejection of claims 6, 7, 14 and 15 under 35 U.S.C. § 103(a) is reversed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

#### AFFIRMED-IN-PART

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